Carcinoma of the Nasopharynx

Treatment with Radioactive Cobalt

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• A method of treatment of carcinoma of the nasopharynx is described, using a bead of radioactive cobalt in a Foley catheter placed through the nose and inside the nasopharynx. As an aid in proper placement of the cobalt bead a portion of the nasal septum is removed first. This method of treatment is to supplement rather than replace other methods of treatment such as external x-ray therapy and surgical excision of lymph nodes in the neck.

Twenty-two patients were treated with radioactive cobalt beads and the results indicated that it is a useful method for treating carcinoma in the nasopharynx.

THE PURPOSES of this paper are to discuss briefly the clinical characteristics of carcinoma of the nasopharynx noted in 80 patients, to describe a technique of treatment with intracavitary radioactive cobalt, and to comment on the results of this treatment in 22 of the patients from 1949 to 1954. The patients were observed at the University of California Hospital and were treated by or under the direction of L. F. Morrison, M.D., of the Department of Otolaryngology and B. V. A. Low Beer, M.D., and R. S. Stone, M.D., of the Department of Radiology.

In an effort to add to the current method of treatment with external x-ray irradiation, when the use of radioactive cobalt was developed for intracavitary irradiation[8] its use in treating carcinoma of the nasopharynx was begun in 1949. Of course, intracavitary irradiation with radium applicators had been used previously, with good results reported by some investigators[4,6,9] and indifferent results by others.[5,10]

CLINICAL CHARACTERISTICS

Carcinoma of the nasopharynx is not a common disease, comprising only 0.3 per cent to 0.4 per cent of all malignant lesions[4,7] and only 2 per cent of all malignant growth of the head and neck.[6] There was record of only 97 cases at the University of California Hospital since 1932, where it represented 0.7 per cent of all cases of malignant disease.

Although it is not the most frequent, it is one of the most malignant growths of the upper respiratory and alimentary tracts. Reports of five-year survival rates in various series range from almost zero[3] to around 20 to 25 per cent.[1,4,5,6,10]

Carcinoma of the nasopharynx is an insidious disease and is often unrecognized until metastasis causes symptoms. The primary tumor in the nasopharynx causes relatively few symptoms in its early stages and must attain considerable size before causing local symptoms such as nasal obstruction, increased nasal discharge or a "plugged" ear. Persistent unilateral serous otitis media in an adult should be considered as being pathognomonic of a neoplasm of the nasopharynx until proved otherwise. Since these tumors are usually anaplastic and tend to metastasize early, it is the metastatic lesion that usually causes the first symptoms.[4,6]

In 47 per cent of the patients in the present series the initial symptoms were referable to metastatic lesions, and 73 per cent of the patients had metastasis at the time of first examination.

The most frequent initial symptoms were enlarged cervical nodes (37 per cent), and nasal obstruction or bloody nasal discharge (35 per cent). Unilateral deafness, pain in the ear, or "plugged" ear was the first symptom in 10 per cent of cases, and in another 10 per cent it was intracranial extension with cranial nerve involvement as evidenced by facial pain or unilateral cranial nerve paralysis. In 8 per cent there was no record of the initial symptoms.

This disease occurred more frequently in males (74 per cent) than females (26 per cent) and occurred predominantly in the middle age group—71 per cent between 30 and 59 years. The highest incidence in any decade was 28 per cent in the 50 to 59 year group. The youngest patient was two years and the oldest 77 years of age.

These data agree generally with other reports as to age and sex incidence and presenting symptoms and metastasis.[4,6,7] Many investigators have noted the racial susceptibility of the Chinese to this disease; Digby and Khoo[2] reported the incidence to be 5 per cent of all cancer in China. With a large Chinese population in San Francisco, it is not unexpected that 27 per cent of the patients in the present series were Chinese.

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In the treatment of patients in the present series, radioactive cobalt was used in the form of a bead contained inside a Foley catheter for ease of handling and positioning. The preparation of this bead and its activation and characteristics are fully described elsewhere.[8] Briefly it can be stated that radioactive cobalt (Co^{60}) in the form of a bead offers a relatively inexpensive point source of gamma irradiation that is monochromatic, almost homogeneous, and has a mean energy of 1.2 million volts. The cobalt, before activation in a neutron reactor, is readily available and can be fabricated into any desired form.

With the patient under general endotracheal anesthesia, a posterior septectomy from the level of the middle turbinate to the floor of the nose is done, leaving a 1-inch portion of the septum at the columella. This provides greatly improved access to and visibility of the nasopharynx both for manipulation and positioning of the cobalt bead and for inspection and examination of the nasopharynx following treatment during the follow-up period. Bleeding at the time of septectomy is controlled with electrocoagulation and packing. The visible tumor in the nasopharynx is thoroughly cauterized at the same time.

The Foley catheter containing the cobalt bead in the center of the inflatable bag is then positioned in the nasopharynx through the nose and the bag inflated. The catheter can be firmly held in place with packing if necessary and the position of the bead checked by x-ray visualization. Placing the bead in the catheter with the inflated bag maintains the bead at a uniform distance from the surface of the nasopharynx and prevents local areas of overirradiation. The bead is left in position for the time calculated to give the desired dosage (usually 2,000 to 6,000 gamma r) and is easily removed after the catheter is deflated. The nasal packing is usually removed on the second to fourth day. (Postoperative bleeding has not been a problem.)

The patients are then given full courses of external x-ray therapy to the nasopharynx and also to cervical fields if there are palpable nodes in the neck. The radioactive cobalt therapy in this series did not replace, but rather supplemented, external x-ray irradiation.

RESULTS

Twenty-two patients with carcinoma of the nasopharynx were treated with radioactive cobalt in the five years from July 1949 to November 1954. Of these, 14 received initial treatment and eight were treated for recurrence of previously treated tumors. Of the 22 patients, 10 are living and 12 have died.

In three of the 14 patients treated initially with cobalt, the tumor was localized in the nasopharynx at the time treatment was begun; in the other 11 cases metastasis had already occurred. The three with localized disease are all living, and of the 11 who had metastasis five are living and six have died.

Of the eight patients treated for recurrent tumor, only one had disease localized to the nasopharynx, and he is still living after three years. Of the seven who had metastasis, one is living and six have died.

In the series of 22 patients, the four who did not have metastasis at the time cobalt therapy was begun are still living. Of the 18 others, six are living.

In only seven of the patients was treatment begun as long as five years ago. Three of the seven are still living.

Fifty-eight patients with carcinoma of the nasopharynx were treated by other means, consisting almost entirely of external x-ray irradiation. Of these, 38 have died and 20 are living, 13 of them five years or longer. Five were treated for recurrent tumor. One of them did not have metastasis and survived for over 15 years. Four had metastasis and none are alive. Fifty-three patients received initial treatment and 19 are living. Of 15 who had only a local tumor at the time treatment was started, nine are living; of 38 who had metastasis, ten are living.

TABLE 1.—*Data* on Patients with Carcinoma of the Nasopharynx Treated with Radiocobalt (as Supplement to X-ray Irradiation)*

	No. Patients	Living	Died
Initial treatment:			
Total	14	8 (57%)	6 (43%)
Localized lesion	3	3	0
With metastasis	11	5	6
Treatment of recurrence:			
Total	8	2 (25%)	6 (75%)
Localized lesion	1	1	0
With metastasis	7	1	6
Overall	22	10 (45%)	12 (55%)

* The period of follow-up observations varied. In only seven cases was treatment started five years ago or more.

TABLE 2.—*Data* on Patients with Carcinoma of the Nasopharynx Treated without Radiocobalt*

	No. Patients	Living	Died
Initial treatment:			
Total	53	19 (35%)	34 (64%)
Localized lesion	15	9 (60%)	6 (40%)
With metastasis	38	10 (26%)	28 (74%)
Treatment of recurrence:			
Total	5	1 (20%)	4 (80%)
Localized lesion	1	1	0
With metastasis	4	0	4
Overall	58	20 (35%)	38 (65%)

* The period of follow-up observation varied.

DISCUSSION

The results obtained with radioactive cobalt therapy, although neither numerous enough to be

statistically significant nor old enough to supply data as to five-year survival, are interesting from several points of view. All the patients treated with local lesions are still alive, two as long as five years. This suggests that the addition of the radioactive cobalt therapy to the external x-ray irradiation may be of greatest value in providing better control of the primary lesion.

Eight of the patients treated for recurrence of tumor had already received full courses of x-ray therapy and were not candidates for further x-ray irradiation. A 25 per cent salvage in these patients is worthwhile.

It is also interesting to note that, although naturally the best results are obtained by any treatment when the tumor is localized, a smaller but substantial proportion of patients with metastatic tumor in cervical nodes or with evidence of erosion of the base of the skull were treated with some success. From this it can be concluded that patients with metastasis should not necessarily be given palliative therapy only, but should be treated with intense irradiation.

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